

Evaluation of Skylab Imagery as an Information Service for Investigating  
Land Use and Natural Resources (Skylab), NASA Contract NAS 9-13364

This report covers the period of April 1-30, 1974. During this period photo enlargements were made for each of the three test sites and the preliminary interpretation has been largely completed. These test sites will now be field checked to determine the validity of the different spectral breakouts. Based on the preliminary interpretation, it does not seem that we are getting as much spectral discrimination as we had hoped. In examining the two visible bands the grey level difference appears to be very subtle. At this time we are not sure if differences have been averaged out in our processing steps or if there simply is less of a difference between the bands than we expected. The infrared bands are very grainy when enlarged to 1:250,000. This problem significantly degrades the resolution of a composite when the infrared is combined with the visible bands. As a consequence, we are getting less differentiation in vegetation and wetlands than we had expected.

In order to obtain a better understanding of the band difference problem, we are setting up some ground photography experiments using similar filters to Skylab, as well as some other combinations. Our photo site shoots across a wide valley with a direct line of sight of about seven miles. We hope to get some information on whether different bands require different processing procedures as a result of atmospheric effects.

The programming steps have been completed on the color prediction model for the diazo composites, but as of this writing we have not completed our analysis of the data. The diazo material have a range of from 5-8 levels of grey on a Kodak step wedge, which is less than half of that on the Skylab photography. We hope to determine if we can sample a larger proportion

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of the grey levels by differentially exposing diazo material for the different bands. And then recombining them in appropriate combinations to maximize color contrast according to the CIE coordinate system.

The S190B black and white and the S190A black and white data was examined to determine the smallest identifiable feature. On the S190B panchromatic high resolution film the roads or road beds or airport runways approximately 30 feet in width can be perceived regardless of material composition (gravel, asphalt, dirt or concrete), as long as there is a sufficiently contrasting background. Buildings approximately 80' X 40' were also detected. Water features include canals and streams down to about 80' and ponds about 150' in diameter.

The S190A black and white panchromatic using filters AA or BB showed features such as roads or runways (asphalt or concrete) about 100' wide, and streams or canals about 200' wide. Ponds were identified if they were about 500' across. The S190A 2424 filter CC or DD were not examined for point detail because of the grainy structure of the photo enlargements and the lack of detail in the imagery.

During May, preliminary field checks will be completed. We expect to be contacting various planning agencies in each of these test sites by early June to discuss our land use interpretations and to introduce to them the potentials of satellite data. In return we expect to get a better feel for the nature of their local problems and how useful satellite data can be in providing them with a new data resource. It is also hoped that we can complete work on our color prediction model sometime during this next reporting period.

Principal Investigator

Agency

Dr. Ernest E. Hardy

*Ernest E. Hardy* <sup>BAS</sup>

New York State College of  
Agriculture and Life Sciences  
Cornell University  
Ithaca, New York